METHOD AND SYSTEM FOR ELECTRONICALLY QUALIFYING SUPPLIER PARTS

BACKGROUND OF THE INVENTION

This invention relates generally to a computer-based
method and system, and more particularly, this invention
relates to a computer-based method and system for qualifying
supplier parts.

Part qualification is a critical element of integrating
a supplier technology into a final product. The failure to
follow all necessary steps can have drastic consequences in
terms of final product quality. To get a jumpstart on
competition it has become increasingly critical to quickly
qualify new, leading-edge suppliers and to get their
technologies integrated into a final product. Currently,
many organizations lack a standard qualification process.
This results in duplicate work and inconsistency. It is
difficult to measure the efficiency of the qualification
process or to know how far along the process is for a
particular supplier part. It is also difficult to determine
accountability for the overall qualification or for a
particular set of sub tasks. Another problem is that there
is currently no easy way to access and track the latest
copies of qualification data because the data is stored in a
variety of electronic and paper based formats. Relevant
data is sometimes lost or thrown out as engineers change
jobs or divisions reorganize. Time is often wasted looking
for data and determining if the data at hand is the most
recent version of the data. In the current environment it

will be difficult to meet the competitive demands of speeding up the qualification process while ensuring high quality supplier parts.

To meet these competitive pressures it would be desirable to have a computer based tool that could serve as a central repository for storing and accessing all qualification data. The tool should also be used to enforce standard qualification processes and as a method of communication between qualification participants. Finally, the tool should include 24-hour a day access for authorized persons around the globe.

SUMMARY OF THE INVENTION

An exemplary embodiment of the invention relates to an integrated computer-based method and system for facilitating part qualification. This computer-based method and system includes a host system receiving a request from a user system to execute part qualification software, executing the requested software at the host system, sending results of the software execution to the user system, receiving input at the host system from the user system in response to the software execution, and providing the user system with output generated as a result of executing the software.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings wherein like elements are numbered alike in the several FIGURES:

FIG. 1 is a block diagram of a portion of the system that includes a plurality of workstations and servers on which the part qualification tool is implemented;

FIG. 2 is a diagram illustrating the system architecture of the part qualification software;

FIG. 3 is a flowchart describing how an engineer could utilize the software tool;

FIG. 4 is a sample front-end screen for the part qualification software application; and

FIG. 5 is a sample qualification plan screen.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In an exemplary embodiment, the part qualification software is implemented through a networked system such as that shown in FIG. 1. Although not necessary to realize the advantages of the present invention, system 100 may be part of a wide area network in which different geographical locations are interconnected, either by high-speed data lines or by radio links, interconnecting numerous workstations at widely disparate locations. In the simplified diagram of FIG. 1, system 100 includes an organization 102 comprising a web server 104, an applications server 106, and a database server 108 that are located on a host system 110 and connected through a network 112 to workstations 114. The term "organization" refers to the system implementing the part qualification application, and is typically an engineering organization. Network 112, an intranet, may comprise a LAN, a WAN, or other network

configuration known in the art. User system workstations 114 may be local or remote to the host system 110 and connected to the host system via network 112. Further, network 112 may include wireless connections, radio-based

5   communications, telephony-based communications, and other network-based communications. For purposes of illustration, however, network 112 is a LAN. A firewall 122 limits access to organization 102 to those network users possessing proper access permissions. In addition, employees of engineering

10   organization 102 may access applications server 106 through a remote device 130 connected to the Internet.

Host system 110 is running suitable web server software designed to accommodate various forms of communications, and which allows information in data storage device 118 to be

15   published on a web site. For purposes of illustration, host system 110 is running Lotus Domino (TM) as its server software. Databases 120 contain a variety of part qualification data and may be situated both local and remote to the host system 110. These databases 120 contain data

20   that is accessed by the part qualification software including technology surveys and test result data. Databases 120 may include commercially obtained software utilized by the part qualification tool to supplement part qualification information. For purposes of illustration,

25   databases 120 include Aspect (TM) software which provides a variety of part information and descriptions commonly used by industries such as organization 102. Databases 120 are collectively referred to as "part qualification database".

Applications server 106 executes the part qualification
software, among other applications utilized by organization
102. Applications server 106 is also running a groupware
application such as Lotus Notes (TM) which allows remote

5   users to access information through its replication
capabilities, provides e-mail services, allows documents
located in multiple databases 120 to be linked together
through its "doc-links" feature, and supports a secure
extranet architecture.

10   Data storage device 118 resides within intranet 112 and
may comprise any form of storage device configured to read
and write database type data maintained in a file store
(e.g., a magnetic disk data storage device). Data storage
device 118 is logically addressable across a distributed

15   environment such as a network system 100. The
implementation of local and wide-area database management
systems to achieve the functionality of data storage device
118 will be readily understood by those skilled in the art.
Information stored in data storage device 118 is retrieved

20   and manipulated via database server 108. Data storage
device 118 provides a repository for a variety of
application information including the part qualification
database of the present invention. A number of other
databases 120 are accessed by the host system 110 because

25   they contain part qualification data such as technology
surveys and test result data.

System 150 comprises a web server 152 that connects
user system workstations 154 to an intranet 156 and to the

Internet. Firewall 158 provides security and protection against unauthorized access to internal network information from outside sources. Each of user system workstations 154 may access web server 152 via internal web browsers (not shown) located on workstations 154. A data storage device 160 can be coupled to server 152. Additionally, an extranet 140 may exist between system 150 and organization 102. System 150 is typically a prospective or existing supplier of organization 102.

The part qualification tool is an e-business software application that supports an environment for collaboratively driving part qualification processes by providing common part qualification plan templates across commodity types and by providing a common repository for part qualification data that is stored in a variety of locations such as databases 120. Suppliers have access to the system in order to review qualification data related to their own products. Suppliers and engineers around the world have 24-hour access to the system. The part qualification tool expedites part qualification and increases the quality of the final product produced by organization 102 by providing a common business process and a shared data repository that can be utilized by all personnel involved in the qualification decision chain. The software runs on applications server 106 that is accessible via user system workstations 114, 130, or 154 connected to the Internet, to extranet 140, or to host system intranet 112. This gives any participant in the part qualification process, with the proper authority, the

ability to view and update data, and the ability to communicate electronically to any other participant in the process. Administration of security and access may be controlled through a gateway application such as IBM's

5 Electronic Supply Chain Interlock (ESI) tool, which is described in U.S. Patent Application Ser. No. 09/658,257, filed on September 8, 2000, entitled "E-Collaboration Commodity Management System and Method" and is incorporated herein by reference in its entirety.

10 FIG. 2 depicts an exemplary embodiment of the system architecture of the part qualification software system which is located on host system 110. FIG. 2 also depicts the categories of data or commodity types that are among the types of information stored in databases 120 and which are

15 elements of the part qualification database 404 utilized by the part qualification software of the present invention. These databases 120 can be remotely located from host system 110 or can be local to host system 110. Archives database 202 refers to a database that stores part qualification

20 plans that are no longer active. Other databases are referenced by the "location" or "status" field of the part qualification plan for a particular supplier part. These include technology surveys 204, data specific to memory qualification 206, data specific to memory commodities 208,

25 quality information data common to all commodities 210, and system testing data specific to a particular corporate division 212. Technology survey database 204 can be created by a development toolkit network software application such

as the one described in U.S. Patent Application Ser. No. 09/711,777 filed on November 9, 2000, entitled "Method and System for Dynamically Providing Materials and Technology Information", which is incorporated herein by reference in

5   its entirety. The above-referenced application allows development and engineering personnel of an organization to share technology information pertaining to new technologies in a collaborative environment and further allows suppliers to provide the organization with technical data pertaining

10 to its products so that the developers and engineers of the organization can make quick business decisions.

Quality information network database 210 includes audit data and can be created using the software tool described in U.S. Patent Application, attorney docket number YOR9-2000-

15 0563US1, which was filed on December 27, 2000, entitled "Method and System for Gathering and Disseminating Quality Performance and Audit Activity Data in an Extended Enterprise Environment", and is incorporated herein by reference in its entirety. The above-referenced application

20 facilitates the auditing process by providing standardized audit forms, reports, and related auditing procedures and information for use by an organization and stores the information in a centralized location for access by the organization.

25 Database 214 contains an index relating part numbers established by organization 102 to supplier part numbers along with a title of the part that is referenced by the software application. Database 216 is a commercial software

application, such as Aspect (TM) that houses large volumes
of part information used by organization 102. Information
is extracted nightly from database 216 and stored in
database 214 for use by the part qualification tool. Part
numbers and technology data from organization 102 can now be
merged or associated with part numbers and data from
database 216 to provide a more comprehensive and up-to-date
library of part information. For example, organization 102
qualifies a particular technology for use. Once the
technology has been qualified, several associated part
numbers can be qualified at the same time. As the part
qualification tool is tied to the Aspect (TM) or other
commercial database 216, a user can then "jump" from a
particular part number record in database 216 to the
relevant technology qualification data in part qualification
database 404.

A framework for the flow of information associated with
the part qualification tool from the point of view of a user
from organization 102 is depicted in FIG. 3. A user can
access the part qualification tool by remote device 130
connected through the Internet. In addition, a user can
access the part qualification tool by one of workstations
114, either local or remote to host system 110, connected
through intranet 112. Access to particular types of data
and application functions may be restricted to particular
users from organization 102.

The system user accesses the part qualification tool
through the main menu screen 400 depicted in FIG. 4.

Referring to FIG. 4, a variety of commodity types 402 are listed as part of the qualification database 404 of the part qualification tool. The user selects a commodity at step 302 from main menu screen 400.

5   Next, the user will be prompted to set up a template for a commodity at step 304. If this option is selected, the user will create a template by entering the type of data required to qualify this commodity type at step 306. Next the user will enter the proposed repositories for the

10   required data and will assign a default viewing tool based on the proposed repository at step 308. The user will set up the security for this template by restricting access to particular system users for updating the template and viewing the template at step 310. Finally, the user will

15   set up a detailed plan template that includes tasks, suggested durations and an entity or individual responsible at step 312.

       If a commodity template already exists for the commodity type selected at step 302, the user will be

20   prompted to enter a technology qualification name at step 314. A list of suppliers for that particular technology will be displayed and the user will select a supplier at step 316. If the user has the proper authority, an option to create or update a qualification plan for the supplier

25   technology will be presented at step 318. The user can then copy the template for the particular commodity and make changes to the type of data required to qualify this commodity type, the proposed repositories for the required

data, and the default viewing tool at step 320. Next, the user will set up or modify the detailed plan at step 322. The plan will be updated with status, person responsible, target dates and due dates. Finally, the user will set up security for accessing the plan at step 324. Access can be restricted based on criteria such as system user, type of data and location of data.

Another option is to view a status screen for the supplier part at step 326. This status screen 500 is depicted in FIG. 5. Screen 500 lists all required qualification information. This includes a description 516 of the qualification data for the subject part or component; a location for, or a text message 510 about, the qualification data; a check box or status box 512 indicating if the qualification data has been approved, and a recommended repository 514 for the qualification data. The screen also includes a qualification status field 520, as well as a description 518 of the supplier part and the part number for both supplier 150 and organization 102. The user can view a reference document via text message field 510 referred to in the plan at step 328. The user will be prompted to invoke a viewing tool at step 330, then be allowed to open the document using the tool at step 332. When the user closes the document at step 334, he/she will be returned to status screen 500 depicted in FIG. 5.

The user can also add a reference document to the list of text messages 510 at step 336. This can be done by creating a document link in which the user selects "create

doc-links" 506, or by a hypertext link (not shown), or by typing in a file name or text regarding the status of the document at step 338. A user with the proper authority can update the status box 512 at step 340 or archive the current plan 502 at step 342. A user can also view the detailed plan 504 at step 344 which includes information such as detailed tasks, person or entity responsible, due dates and status information. Finally, the user can return to main menu screen 400 of FIG. 4 by selecting that option 508 on the status screen 500 at step 346.

A supplier at system 150 with a part going through the part qualification process could also access the part qualification software tool running on host system 110 through one of user system workstations 154. The supplier could be limited to a subset of functions such as viewing his own tasks in the detailed plan or accessing his own technology surveys. The capability exists for suppliers to be limited to specific application functions and specific data.

This part qualification tool may also be invoked via the electronic supplier qualification and quality management software tool described in U.S. Patent Application, Attorney docket number YOR9-2000-0559US1, which was filed on December 29, 2000, entitled "Method and System for Providing an End-to-End Business Process for Electronic Supplier Qualification and Quality Management", and is incorporated herein by reference in its entirety.

This invention supports the part qualification process

by providing the ability to access all of the part qualification data through a single computer interface that can be used by everyone involved in the part qualification process. In addition, this invention also supports the part qualification process by providing a template that can be used to produce consistent qualification plans across a commodity type. This innovative interrelation of the new business process with an e-business framework enables a critical competitive advantage in time to market, cost avoidance through increased quality, elimination of redundancy, increased consistency, and improvement to both internal and external communications.

Establishing a consistent template for each commodity type and a common tool for accessing the data ensures consistency and makes it easy to education system users. Time will not be wasted trying to understand the status of various qualification plans due to differences in tasks and level of plan detail. It will be easier to determine the status of individual part qualifications because common reports can be produced. Communication will be expedited because it will be easier to determine who is responsible for a particular task.

The common data repository for common requirements also provides many benefits. All enterprise departments can be given access to the part qualification software but security can be implemented at various levels such as commodity and supplier part. The system, by providing the ability to link to doc-links, hypertext links and files located anywhere, is

flexible enough to handle all data regarding technology qualification. The common data repository eliminates redundancies and improves communication because time is not wasted searching for the latest version of a piece of data. In addition, failures can be marked for root cause analysis. In summary, the tool supports better part qualification which will result in higher quality final products.

As described above, the present invention can be embodied in the form of computer-implemented processes and apparatuses for practicing those processes. The present invention can also be embodied in the form of computer program code containing instructions embodied in tangible media, such as floppy diskettes, CD-ROMs, hard drives, or any other computer-readable storage medium, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. The present invention can also be embodied in the form of computer program code for example, whether stored in a storage medium, loaded into and/or executed by a computer, or transmitted over some transmission medium, such as over electrical wiring or cabling, through fiber optics, or via electromagnetic radiation, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. When implemented on a general-purpose microprocessor, the computer program code segments configure the microprocessor to create specific logic circuits.

While preferred embodiments have been shown and

described, various modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the present invention has been described by way of illustration and not limitation.